

ORIGINAL

BEFORE THE

Federal Communications Commission ORIGINAL
FILE

In the matter of

Comments to the Notice of Proposed
Rule Making and Tentative Decision
to the Commission's Rules to Establish
New Personal Communications Services)

) GEN Docket No. 90-314/
) ET Docket No. 92-100, 92-9
)
) RM-7140, RM-7175, RM-7617,
) RM-7618, RM-7760, RM-7782,
) RM-7860, RM-7977, RM-7978,
) RM-7979, RM-7980
) PP-35 Through PP-40, PP-79
) through PP-85

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To the Commission:

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CELSAT COMMENTS

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

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Services)

To the Commission:

CELSAT COMMENTS

CELSAT Inc., (CELSAT) petitioner in RM-7927¹, hereby comments on the Commission's *Notice of Proposed Rule Making and Tentative Decision* released in the above-captioned proceeding on August 14, 1992. In support thereof, CELSAT states as follows:

SUMMARY

CELSAT believes the FCC should proceed with nearly all of the tentative decisions outlined in its *Notice of Proposed Rule Making and Tentative Decision* (NPRMTD) regarding Personal Communications Services (PCS) as rapidly as possible. CELSAT also suggests that new rules be added or select rules amended to allow hybrid space and ground PCS (i.e., *hybrid PCS*) in

¹ CELSAT's original petition for rule making was in the RDSS bands and designated RM-7927. In that filing CELSAT also asked for spectrum outside that band in the S-band between 2.1 and 2.4 GHz as the U.S delegation to WARC-92 had recommended 80 MHz in the band for generic Mobile Satellite Service (MSS) as an alternative.

addition to the goals already outlined by the Commission. The spectrum immediately adjacent to the upper band of the Commission's proposed three block terrestrial PCS proposals, 1975-1990 MHz and its companion band at 2165-2180 MHz, both within the emerging technologies band, are well suited for hybrid PCS systems. This spectrum should not be allocated to other PCS use, and particularly not for use by local exchange carriers as the Commission proposed.² This is because of the limited amount of spectrum in the emerging technologies band with primary MSS and mobile terrestrial designation -- designations necessary for hybrid PCS operation. CELSAT also proposes that the 5 MHz band pair at 1970-1975 and 2160-2165 MHz, currently proposed as part of the third PCS block, be set aside for hybrid PCS use, at least on a secondary basis.³ Finally, CELSAT urges the Commission to adopt a nationwide spectrum allocation for hybrid PCS, and initiate a hybrid service and interoperability rule making to accommodate the use of hybrid space/ground technology in the emerging technologies spectrum.

² In paragraph 78 on page 31 of the Commission's NPRMTD the Commission identified 1895-1900 and 1975-1980 as a possible band it would consider to award spectrum to local exchange carriers

³ While theoretically CELSAT could use any spectrum pair consisting of at least 5 MHz between 1.0 and 3.0 GHz for its ground requirements, the most practical spectrum would have a designation for both space and ground use, allowing the fullest hybrid operation. This dual designation would allow CELSAT's system to perform in its most robust and flexible mode, that being with dynamic allocation of spectrum between space and ground use within each 1.25 MHz subband of each of the 100+ space cells of CELSAT's hybrid system. This dynamic reallocation has practical advantages as system capacity requirements between space and ground will undoubtedly evolve over time to meet demand growth in local markets, or possibly in the face of an unanticipated event such as a natural disaster (e.g., a hurricane or earthquake).

CELSAT has petitioned the Commission for rule changes and a pioneers preference related to its proposal to construct and operate a *hybrid personal communications network* ("HPCN") in the former RDSS band. CELSAT's interest in operating in the ET/PCS bands arises from relatively recent intervening circumstances, particularly the outcome of WARC 92, which might prevent it from operating the terrestrial component of its HPCN in the same spectrum band as its MSS/RDSS space component.⁴

As the Commission stated in its NPRMTD⁵ "the primary focus of PCS will be to meet communications requirements of people on the move." The Commission should not allow this broad and flexible vision of service concepts to be constrained or limited by the particular PCS transport media. In fact, users of any PCS service will be better off having multiple delivery

⁴ CELSAT has petitioned for reconsideration in part of the Commission's NPRMTD to exclude CELSAT from the RDSS proceedings. CELSAT's request was based upon the fact that the Commission overlooked evidence that (1) the CELSAT satellite element, a geo satellite, can share spectrum with other LEO systems and, in fact, requires less flux density from the satellite at the ground per user, and less user EIRP than any of the LEOs. This is so simply because the overall propagation loss, including the very much greater satellite antenna gain possible, is less for CELSAT than for any competing system -- GEO or LEO. And, (2) at an acceptable loss in overall traffic allocation flexibility, the hybrid ground element of CELSAT can be operated in a noncontiguous subband. See, CELSAT Petition for Reconsideration, October 5, 1992, filed in Amendment of Section 2.106 of the Commission's Rules to Allocate the 1610-1626.5 MHz and the 2483.5-2500 MHz Bands for Use by Mobile Satellite Service, Including Non-geostationary Satellites, Notice of Proposed Rule Making and Tentative Decision (NPRMTD), ET Docket No. 92-28, 7 FCC Rcd. ___, released September 4, 1992.

⁵ Paragraphs Nos. 29 and 30 on page 14 of the NPRMTD gave the Commission's overall service definition.

options to choose from that include both space and terrestrial based transport, as long as full wireless connectivity to the local public switched network exists.

Thus, the Commission should take actions which encourage the provision of all of the service concepts potential providers might envision as long as demand exists for these services and as long as the services are technically feasible. The rules for assigning PCS licenses should therefore encourage implementation of technology that allows the widest range of service that can be offered at the lowest possible price point to consumers. CELSAT believes that the most flexible and the lowest cost PCS architecture is a hybrid one which combines the best features of space- and ground-based transport into one, integrated overall system.

BACKGROUND

CELSAT is a California company with business and economic ties to the state and across the country. CELSAT has been established to provide innovative wireless PCS on a nationwide basis using the latest proven technology that combines code division multiple access (CDMA) terrestrial service with CDMA high gain antenna geostationary satellite service into one integrated system. CELSAT plans to eventually expand its system architecture worldwide deploying regional systems in Europe, the Middle East, Asia, Africa or South America. The specific markets chosen will depend on the prospects for profitable operation.

CELSAT has been issued a patent on its hybrid architecture which, among other things, covers the use of CDMA and a network controller to automatically determine whether the user

of a handset receives a space or ground circuit. Because of the cost advantages available through CELSAT's hybrid approach, PCS service will be offered at price points up to 50% lower than today's cellular. The target price points will be highly attractive to a large percentage of the general population.

CELSAT will offer a full range of services that fall under the broad umbrella of PCS, including most of the specific services advocated at the FCC's En Banc hearing⁶. The only limits CELSAT has established for service provision are that the services be technically viable, of interest and value to consumers, and have reasonable profit potential over the long term. CELSAT will focus its efforts both on those services known to have demonstrated end user demand, such as mobile and portable voice, data, and position determination as well as emerging services such as compressed video and other multimedia applications. All services will be available through a single handheld, lightweight portable unit which is expected to retail for less than \$500 when manufactured in volume production quantities.⁷

⁶ The FCC held an En Banc hearing for PCS on December 5, 1991 in the matter of Amendment of the Commission's rules to establish new personal communications services. Numerous firms participated representing a cross section of those interested in PCS. The firms and individuals participating proposed many visions of what potential services could be offered under the broad umbrella of PCS. Many of the service concepts proposed overlapped or were mutually exclusive. Celsat will offer a subset of these services based on market demand and profit potential.

⁷ It should be noted that the tremendous end user capacity inherent to CELSAT's HPCN proposal makes it one of the few new system proposals with enough volume to ensure the very large numbers of potential users needed to support high volume, low cost production of handheld terminals. CELSAT's potential market of 20-30 million customers not ensures the necessary volume production, but also promises a large enough market to ensure multiple entry by manufacturers.

HYBRID PCS

With 220 MHz of spectrum potentially available for emerging technologies, one or more bands should be allocated for integrated space/ground hybrid PCS systems and services. One or more hybrid space and ground PCS participants should be licensed irrespective of the number of terrestrial only PCS licenses. Moreover, licensee access to any allocation in the ET bands for hybrid use should be independent of the licensee's contemporaneous use of other non-contiguous bands, such as the RDSS L/S-Band (on a shared basis or otherwise), for MSS/RDSS satellite only operation.⁸

CELSAT clearly stands out from the large number of firms proposing PCS because of its unique hybrid approach to the provision of personal communications services. To date PCS aspirants have focused on terrestrial-only PCS systems and have failed to consider the significant advantages available through a combined space and ground hybrid system. In contrast, the hybrid space/ground system proposed by CELSAT promises the greatest service flexibility, the lowest cost,

⁸ For example, CELSAT's HPCN CELSTAR system requires about 10 to 13 spectrum subbands of 1.25 MHz each, all of which would be 100% re-usable in each of approximately 100+ space cells covering the entire United States. During normal operation all but two or three of these subbands will, at all times and in all space cells, be used exclusively for spaced-based MSS/RDSS communications. The other two or three subbands will be used predominantly throughout most space cells for terrestrial mobile communications exclusively, but where not needed for this purpose they could be used either to supplement capacity for additional space communications (such as in rural markets) or, if not allocated for space use, simply left dormant in geographic areas where terrestrial service is not warranted.

Ideally, the 1.25 MHz subbands should be in one contiguous band, but technically (and within certain limits) they do not have to be. Thus, CELSAT anticipates that it will apply for access to use the RDSS L/S-Band on a shared basis for the MSS/RDSS component of its hybrid service and apply separately for access to additional capacity, such as in the ET band, for the hybrid terrestrial/space or terrestrial only component.

and the maximum service coverage and availability needed to serve the largest number of consumers.

Specifically, the space-based elements of CELSAT's HPCN system provide ubiquitous coverage over the entire country making low cost cellular service available in rural and outlying areas. The ability to divert "slivers" of spectrum (1.25 MHz subbands) for a ground-based component in selected areas facilitates maximum subscriber capacity covering the more densely populated urban areas, while also eliminating for the largest proportion of users the sometimes noticeable transmission delay associated with the geostationary satellite. This added terrestrial capacity can be expanded through cell splitting linked closely to increases in demand, rather than being driven by a need to provide initial service area coverage over the widest possible geographic area.

Another reason for the effectiveness of the CELSAT hybrid concept is affords the smallest satellite beam or "footprint" (i.e., space cell size) of any mobile satellite design proposed thus far, GEO or LEO. Specifically, CELSAT's space cell size is about 140 miles in diameter affording a natural and economically achievable progression from terrestrial cell sizes of the order of ten miles in diameter.

Taking the strengths of each transport medium allows CELSAT to offer an extremely low cost design and the broadest range of services, including position determination, compressed video and nationwide paging -- services typically unavailable on limited capacity terrestrial-only PCS systems. As the only space-based PCS provider that has publicly announced intentions to deploy either a hybrid or a space-based PCS

service, CELSAT clearly has a unique perspective. CELSAT believes that it will be the first of several space-based systems worldwide to be announced over the next few years that employ large antenna geostationary satellites with direct linkages to terrestrial networks provided by one firm. (In fact, INMARSAT's Project 21, a new satellite system for the twenty-first century, is now also considering use of an advanced geostationary satellite system for a new MSS system⁹.)

CELSAT's hybrid approach contrasts with conventional ground-only-based PCS services which must, in one way or another, compete with the two cellular licenses in each market on a coverage basis. This will require terrestrial systems to build out their networks in advance of demand to match the coverage available from cellular providers who offer competing services. Because PCS systems will operate at higher frequencies in the 2.0 GHz band, they will require many more cells than conventional cellular (which operates at 800 to 900 MHz) to meet the difficult to match coverage standard already set by the cellular industry in most markets.

CELSAT's hybrid PCS system could, however, provide competitive relief to terrestrial only PCS licensees whose subscribers desire access to ubiquitous coverage. Whether licensed in its preferred RDSS L/S-Band or in the suggested ET band, CELSAT's system will have the capacity, price structure and technical compatibility to operate with other CDMA spread spectrum

⁹ INMARSAT is expected to recommend to its signatories sometime in November, 1992 which direction it will take for its Project 21 system. CELSAT was among the competing industry influences which introduced INMARSAT to the concept of using a large high gain antenna with a geostationary satellite in early 1992.

personal communications devices operating in the 2 GHz band. (The PCS handsets will, however, have to be under the control of CELSAT's network controller.) As such, CELSAT's space capacity could service ordinary ground-based PCS users when they roam outside of their PCS territories. While this would require "dual mode" phones (although they could be "switchless") it appears doubtful that such dual mode operation involving two or more separate service providers could achieve the degree of total system integration necessary to facilitate truly transparent, seamless handover and economically optimum allocation between space and terrestrial modes that is the feature of the fully integrated hybrid CELSAT system.¹⁰

Because there have been no major hybrid space and ground PCS systems proposed other than CELSAT's CELSTAR¹¹, there has been little discussion of the advantages of combining space and ground transmission media in the context of PCS services. CELSAT's HPCS system represents a major advance over the *future public land mobile telecommunications system* ("FPLMTS") concept proposed internationally because of its far superior spectral efficiency, the ability to integrate mobile and portable applications together with high speed handoff

¹⁰ While CELSAT plans to service compatible users of other PCS and/or MSS systems operating in the 2 GHz band, this ability is no substitute for CELSAT's requirement for a terrestrial spectral component of its own. The large regional hub infrastructure required by the CELSAT HPCN inherently lends itself to the very efficient use of a fully integrated terrestrial component in the most densely populated market areas such that it would be a terrible waste of spectral efficiency and ground resources not to make this component available.

¹¹ The ITU's radio technical committee, the CCIR, recommended setting aside 230 MHz in the 1-3 GHz band around the world for FPLMTS starting in 1988. Of this amount 167 MHz would be assigned to communications with mobile stations (vehicles); 60 MHz would be reserved for stationary or slow-moving stations (pocket-sized portable units). This is not a true hybrid system.

capabilities in a single low power device, and its ability to operate within a single contiguous band or, at most, two non-contiguous bands of the same total bandwidth.¹²

In its preferred mode the CELSAT hybrid concept encompasses space and ground PCS service in the same spectrum band as the least expensive, most spectrally efficient and most flexible way to offer PCS services. This approach allows maximum frequency reuse and low cost as the capacity of the ground system can be increased at a rate that matches demand growth. By using the satellite to provide the coverage, a hybrid system can save capital costs in the early stages of system design by only adding terrestrial cells when demand requires it and still retain the ability to match or exceed existing and planned cellular service in coverage. Using both technologies results in the lowest cost system with the widest variety of potential services.

PCS SPECTRUM BANDS

The Commission should proceed with the three blocks of spectrum it has tentatively designated as Blocks A, B and C, occupying 30 MHz each from 1850-1895 MHz and 1930-1975 MHz, for terrestrial PCS. However, CELSAT is concerned to the extent the band pairings overlap with WARC-92 designations for mobile satellite service and thereby might preclude the

¹² Under the FPLMTS concept as many as three separate bands of 20-30 MHz each are contemplated, with each band serving a different mode of communications. End user communications between modes (e.g., land mobile to satellite mobile) will require either frequency conversion at signal cross-over points (e.g., mobile earth stations) or dual mode communications devices requiring manual switching from one mode to another. In contrast, CELSAT has demonstrated that it can achieve the same FPLMTS functionality and mobility using one spectrum band of 20 MHz or less, dynamically allocable subbands distributed between space and terrestrial use as loading dictates, and dual mode devices which can communicate in either mode transparently to the end user.

possibility of providing MSS in these bands in the future consistent with the WARC-92 recommendations¹³. Already the Commission has eliminated from reallocation consideration the 1990 to 2010 MHz band which will not be reallocated for emerging technologies use. The block pairings recommended by the Commission for PCS, coupled with spectrum designated for emerging technologies, leave available for space-based service only a resulting unpaired band at 2120-2150 MHz, and 20 MHz of paired spectrum in the 1970-1990 and 2160-2180 MHz bands which has a designation consistent with hybrid space and ground system operation but which overlaps with 5 MHz of a PCS block at 1970-1975 and 2160-2165 MHz.

As a result, the 1975 - 1990 MHz band and its companion band at 2165 - 2180 MHz appear to be the only near term paired band available for a frequency duplexed hybrid system. While this clearly provides enough spectrum for one hybrid system sharing by HPCNs could be difficult, if not impossible, at least in the ground portion of the spectrum.¹⁴

CELSAT submits that, at a minimum, the Commission must reserve the 1975 - 1990 MHz band and its companion band at 2165 - 2180 MHz for space and ground hybrid PCS system use. This allocation would, in effect, become a fourth PCS band, and therefore would appear to obviate the need for any more than the three terrestrial PCS licenses suggested in the PCS

¹³ At WARC-92 the band 1930 to 1970 MHz was paired with 2120 to 2160 MHz and designated for mobile satellite service on a secondary basis. In addition, the 1970 to 2010 MHz band was paired with 2160 to 2200 MHz and designated for co-primary satellite use in region 2 beginning in 1996 in footnote 742 u.

¹⁴ AMSC, for one, has indicated that 220 MHz should only be the start of spectrum reallocation and that sharing with other services is not likely to be feasible for MSS.

NPRMTD. This reallocation would assure the hybrid system operator the same 15 MHz of paired spectrum as is being proposed for the terrestrial PCS licenses.

The Commission should also consider an alternate band pairing scheme that leaves the 5 MHz pair at 1970 - 1975 MHz and 2160 - 2165 MHz available for hybrid PCS use on a secondary basis. This would permit effective expansion of the primary 15 MHz pair at 1975 - 1990 MHz and 2165 - 2180 MHz for hybrid MSS and PCS purposes in selective geographic markets where this PCS block is not being used for conventional PCS applications, such as in rural areas.

In addition, assuming the Commission adopts the suggested spectrum blocks A, B, and C for PCS, the 2120 - 2150 MHz unpaired band of emerging technologies spectrum which is currently allocated for MSS use should be reserved for possible future MSS?PCS use. Reserving this spectrum for time duplexed mobile satellite service as part of a hybrid FPLMTS system, for example, might be viewed favorably by international WARC-92 participants¹⁵ and by those international participants desiring potential joint space and ground operation in the 1885 to 2025 MHz and 2110 to 2200 MHz bands for FPLMTS.¹⁶ Finally, it might also allow for yet additional

¹⁵ The EC proposed UMTS at 1900-2200 MHz and FPLMTS at 1900-220 MHz, both at WARC-92.

¹⁶ See International Telecommunication Union, Final Acts of the World Administrative Radio Conference (WARC-92) and Addendum and Corrigendum to the Final Acts of the World Administrative Radio Conference, Malaga-Torremolinos (1992). In the 2.0 GHz portion of the spectrum, Region 2 received a primary allocation for MSS in the bands 1970-2010 (Earth-to-Space) and 2160-2200 MHz (Space-to-Earth) and a secondary allocation in the bands 1930-1970 (Earth-to-Space) and 2120-2160 MHz (Space-to-Earth).

separate hybrid PCS systems to be deployed should the Commission view multiple systems as necessary to meet consumer demand or to ensure competition.

NATIONWIDE SPECTRUM ALLOCATION

In the NPRMTD, the Commission concluded that "PCS service areas should be larger than those initially licensed for cellular, although how much larger is not entirely clear."¹⁷ One of the four options the Commission proposed was for nationwide licenses. A nationwide license concept will strengthen America's global competitiveness. The global reality we face as a nation is that in other countries new digital cellular and PCS licenses have been awarded on a nationwide basis and many of the next generation systems on the drawing board call for multinational or global licenses provided to one business entity¹⁸.

The United States must have at least one PCS license based on geographic territories that cover populations and land masses comparable to our foreign competition. This will help insure a fully integrated, seamless network for a PCS block of spectrum that will provide the scale economies and superior access to key technology to sustain America's superiority. This approach will also ensure that one consistent set of services of a high level of quality will be available for all U.S. citizens, particularly if the award of the license is linked to providing ubiquitous coverage. Ubiquitous coverage

¹⁷ Paragraph 60, page 25 of the PCS NPRMTD.

¹⁸ The LEO/MEO satellite systems proposed by Motorola, TRW and others for the RDSS band in the United States and worldwide represent examples of the increasingly global scope of proposed systems. Similarly the Future Land Mobile Public Telephone System concept will cover all of Europe.

comes automatically with an appropriately designed space-based HPCS system.

Irrespective of what the Commission decides for conventional or terrestrial PCS, a nationwide license is not only the only economically feasible service area for a hybrid PCS provider, but it is inherent to a satellite-based system. The nationwide or continental coverage uniquely associated with satellites makes a nationwide territory the only practical option.

PIONEER'S PREFERENCES FOR HYBRID SYSTEMS

The Commission recently awarded three pioneer's preference tentative licenses to applicants for terrestrial PCS¹⁹. CELSAT not only strongly believes in the pioneer's preference program, but its own success may be heavily dependent on the Commission's goal to reward fledgling firms with innovative ideas and technologies with tentative licenses. Clearly, the pioneer's preference program should be used as much as possible to help determine tentative licensees for hybrid PCS systems and other innovative technologies proposed in the emerging technologies band.

In addition to its technical and service innovations, CELSAT's unique emphasis on job creation, job training and a nationwide network that combines low cost satellites to serve rural and outlying areas with a ground-based cellular-like component to serve densely populated areas further differentiates CELSAT from the myriad of other entrepreneurial organizations

¹⁹ On October 8, 1992, the Commission tentatively awarded Pioneer's Preferences to three applicants for new Personal Communications Services: American Personal Communications, Cox Enterprises, and Omnipoint Communications

proposing to offer some form of PCS. CELSAT epitomizes the entrepreneurial zeal of America's industriousness and creativity, and urges the Commission to establish rules for PCS participation that allow and encourage small businesses like CELSAT to compete in PCS and other emerging technologies markets.

In the Licensing Mechanism section of the PCS NPRMTD, the Commission sought ways to reduce the costs and delays associated with lotteries and competitive bidding, and possible ways to reform both processes.²⁰ CELSAT is proposing below some additional considerations which the Commission ought to incorporate into its license award process to help assure the desired small business participation through further reforms in the licensing process.

INFRASTRUCTURE PREFERENCE

It is generally recognized that a strong communications infrastructure represents a critical prerequisite to a strong America. In addition, worldwide leadership in industries such as information services, computers and biotechnology depend on easy to access and inexpensive transport of voice and data over flexible and reliable communication networks. Therefore, substantial consideration should be given to those applicants and proposal which have the most promise toward contributing to America's infrastructure needs. CELSAT will build and operate such a network -- one that is unique in that it will be the only "untethered" network -- and, as such, typifies the kind of candidate and system proposal which ought to attract strong Commission consideration.

²⁰ Paragraph 82 on page 32 of the Commission's NPRMTD.

MINORITY PARTICIPATION

CELSAT has a strong commitment to equal opportunity for all Americans as evidenced by its management and ownership structure which includes two ethnic minority officers and significant minority ownership (in excess of 10% of the outstanding equity) of the company. CELSAT firmly believes that all Americans, regardless of ethnic or social background, should have an opportunity to participate in the wireless communications revolution. In developing its rules for participation eligibility, the Commission should reward firms willing to emphasize and guarantee diverse participation in their PCS proposals.

COMPETITIVE BIDDING

CELSAT believes the chief issue the Commission faces in allocating spectrum involves how to bring services to market as fast as possible while fostering competition, innovation and fairness to potential spectrum applicants. CELSAT believes that, without the modification proposed below, a competitive bidding process is inappropriate for PCS licensing. It basically favors large companies with huge financial resources over smaller companies of more modest means that may have better technology or superior service concepts. The cost of obtaining a competitively bid license coupled with the large capital outlay necessary to construct PCS networks will lead to high service prices for consumers and ineffective competition against existing spectrum holders. Additionally, the existing cellular spectrum holders may outbid other PCS applicants for the spectrum to protect their existing franchises rather than to offer new services. Competitive bids clearly favor those interested in maintaining the status quo over small, innovative newcomers. Thus,

competitive bidding may not be the best licensing method if the Commission wants a competitive industry structure.

However, there may be one situation where competitive bids could have merit. For example, if the bid price could be paid over the life of the license term with initial payments delayed until the venture began to receive revenues. This situation would actually support the most efficient system designs as these systems could afford to pay more in a competitive bid. It would also allow a small player with an extremely efficient design such as CELSAT a fighting chance versus larger firms with better initial capitalization, but with less efficient systems.

MODIFIED LOTTERY PROCESS

While a lottery seems to be quick and efficient in terms of using the Commission's time lotteries encourage speculators who may have no sincere interest in providing PCS services. Instead, these speculators may enter the lottery strictly for the purpose of obtaining a license that they can be later resold for a profit. For satellite or spaced-based services, particularly, where the number of qualified applicants is likely to be small and the cost of entry huge, a lottery seems especially inappropriate. Pioneer's Preferences, a comparative hearing, or a negotiated rule making session among multiple qualified applicants are much more appropriate and effective ways to award licenses.

CELLULAR AND LEC PARTICIPATION

In the PCS NPRMTD, the Commission indicated that "Concerns about competition would not be raised, however, if cellular service providers were to acquire PCS licenses outside their

current service area."²¹ CELSAT agrees with this point and support's the Commission's intention to allow cellular license holders to be eligible to compete outside of their service area. However, the organizations controlling cellular licenses should not be allowed to own or control PCS licenses that overlap at all the geographic territory covered by their cellular licenses²². This would provide too much opportunity for abuse and might act to stifle competition.

Similarly, local exchange carriers (LECs) should not be allowed to own PCS licenses in their operating territories. The Commission indicated in the PCS NPRMTD that it was considering allowing LECs access to an additional 10 MHz of spectrum (possibly 1895-1900 MHz and 1975-1980 MHz)²³. If the Commission decides to set aside spectrum exclusively for the LECs, it should not consider for this purpose the 1975-1980 MHz band. This would take away from the limited amount of spectrum available for space or hybrid PCS use.

CELSAT further believes that providing spectrum to the LECs would be grossly unfair, as these firms might have a significant cost advantage over other firms without the same favored access to the PSTN infrastructure²⁴. Eliminating this

²¹ Paragraph 64 on page 27 of the Commission's NPRMTD.

²² Minor overlaps of 5% or less might be allowed under de minimis exceptions.

²³ Paragraph 78 on page 31 of the Commission's NPRMTD.

²⁴ The Commission in the PCS NPRMTD footnote 51 indicated that if the LEC were granted spectrum it would be charged with filing an adequate plan for non-structural safeguards against discrimination and cross-subsidization before beginning PCS service on an integrated basis. CELSAT remains skeptical that any plan could be devised that would not favor the LEC except for total separation

potentially unfair cost advantage by restricting LEC access to their wireline infrastructure would potentially create a level playing field for all PCS licensees. However, this would result in essentially the same industry structure found in cellular today as the parent companies of most LECs already have cellular licenses which cannot share facilities with the LEC.

TECHNICAL CONSIDERATIONS

CELSAT raised the importance of the power flux density issue in its original petition for rule making and again in its Petition For Reconsideration filed October 5, 1992. The same issue applies to space based systems that operate in the 2.0 GHz band. While no power flux density limits exist in the targeted spectrum, CELSAT requests that the Commission be flexible in setting limits as it has a tremendous effect on system capacity. For example, CELSAT can effectively double its space system capacity in the 1975-1990 MHz band with two satellites, from 25,045 VG circuits to 52,415 VG circuits, if no power flux density limit exists. (These capacity estimates include the continental U.S., Alaska, Hawaii, and the Virgin islands.) Keeping the power flux density limits high will allow CELSAT's space system to be limited only by the power available on the satellite, thereby substantially increasing capacity.

CONCLUSION

The Commission has done a superb job in laying out the structure and identifying key issues that remain to be resolved before terrestrial based PCS can become a reality. To date the industry has expressed little interest in offering space or satellite-based PCS service. This appears to be the

of wireline and PCS operations.

result of much of the satellite industry's efforts focusing on low earth orbit satellite technology. However, geostationary satellite technology has advanced to the point where a hybrid space and ground PCS system makes economic and market sense.

CELSAT would like the Commission to advance its thinking on the appropriate role for a space and ground hybrid system to the point it is now at for terrestrial-based PCS systems. To aid in this process, CELSAT has developed several rule making suggestions. These suggestions cover the most appropriate spectrum bands, the amount of spectrum, the service area to be covered, thoughts on licensing mechanisms, thoughts on competition, and several others ideas regarding the relationship between terrestrial and hybrid PCS. Implementing these suggestion will go along way towards setting the structure to launch combined space and ground PCS.

Respectfully Submitted,
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